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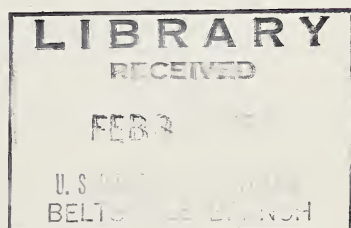
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# Effects of

## Close-row Spacings on PEANUT YIELD and on Production Equipment Requirements

Production Research Report No. 77

Agricultural Research Service  
U.S. DEPARTMENT OF AGRICULTURE  
in cooperation with  
Virginia Agricultural Experiment Station



## CONTENTS

|                            | <i>Page</i> |
|----------------------------|-------------|
| Experiments, 1953-56.....  | 2           |
| Materials and methods..... | 2           |
| Results.....               | 2           |
| Experiments, 1957-59.....  | 3           |
| Materials and methods..... | 3           |
| Results.....               | 5           |
| Discussion.....            | 12          |
| Summary.....               | 13          |

## ACKNOWLEDGMENTS

The authors wish to express appreciation to C. Y. Kramer, Virginia Polytechnic Institute, Blacksburg, Va.; to E. J. Koch and E. L. Cox, Biometrical Services, Agricultural Research Service, U.S. Department of Agriculture, Beltsville, Md., for performing statistical analyses of the data; and to L. Q. Hines, Ferguson Manufacturing Company, Suffolk, Va., for assistance in developing equipment for digging closely spaced peanut rows.

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# Effects of Close-row Spacings on PEANUT YIELD and on Production Equipment Requirements

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Experiments to study the effects of close-seed and close-row plantings on peanut yield were conducted by experiment stations in Alabama, Arkansas, Florida, Georgia, North Carolina, South Carolina, and Texas before 1951.<sup>1</sup> In general, the largest yields resulted from peanuts planted thickly in narrow rows.

In 1955, Cannon<sup>2</sup> of North Carolina described and illustrated equipment and methods for closely spaced peanut plantings. His study showed that runner-type peanuts planted in 36-inch rows outyielded those planted in 42-inch rows by about 28 percent, and bunch-type peanuts planted in 24-inch rows outyielded those planted in 36-inch rows by about 37 percent. In 1960, Shear and Miller<sup>3</sup> of Virginia reported that

<sup>1</sup>NATIONAL FERTILIZER ASSOCIATION. THE PEANUT, THE UNPREDICTABLE LEGUME. Washington, D.C., 333 pp. 1951.

<sup>2</sup>CANNON, B. M. ENGINEERING ASPECTS OF CLOSE-ROW PEANUT PRODUCTION. N.C. Agr. Expt. Sta. Dept. Agr. Engin. Inf. Cir. 11, 13 pp. 1955.

<sup>3</sup>SHEAR, G. M. and MILLER, L. I. INFLUENCE OF PLANT SPACING OF THE JUMBO RUNNER PEANUT ON FRUIT DEVELOPMENT, YIELD, AND BORDER EFFECT. Agron. Jour. 52: 125-127. 1960.

planting Jumbo Runner peanuts in variable spacings, as close as 6 inches between plants, resulted in higher yields as the space between plants was decreased. In 1962, Shepherd<sup>4</sup> of Georgia described and illustrated a procedure recommended for growing peanuts in close rows, but did not show yields from the spacing studies.

In preliminary investigations by the Agronomy Department at the Tidewater Research Station, Holland, Va. (1950-52), bunch- and runner-type peanuts planted in uniformly spaced 18-inch rows outyielded those planted in 36-inch rows. (Uniform rows with 36-inch spacings are the "check," and are referred to as "conventional.") These and later studies were conducted by the Agronomy Department on relatively small plots, and hand labor was used for both production and harvesting operations.

Preliminary machinery studies on closely spaced peanut plantings at Holland were begun in 1953 and were continued

<sup>4</sup>SHEPHERD, J. L. NEW DEVELOPMENTS IN PEANUT PRODUCTION EQUIPMENT AND PROCEDURES. Proc. 2nd Nat. Peanut Res. Conf.: 63-71. 1962.

through 1956. These studies were used as guidelines for the more intensive experiments conducted from 1957 through 1959.

The results of the work performed in 1953-56 and in 1957-59 are presented in this publication.

## EXPERIMENTS, 1953-56

### MATERIALS AND METHODS<sup>5</sup>

Preliminary machinery studies were made from 1953 to 1956 on various close-row plantings of peanuts that could be produced and harvested with a minimum of change in current equipment and methods. The effects of herbicides used with different row spacings and with different planting and cultivating equipment were also studied. Both bunch- and runner-type peanuts were used in these studies. Seeds were planted 6 inches apart in each row. Spacings and the year investigated were as follows:

|  |         |
|--|---------|
| 28-inch spaced rows.....   | 1953    |
| 36-inch spaced rows.....   | 1954    |
| Three 18-inch spaced rows on a bed, 72 inches between bed centers.....   | 1954    |
| 30-inch spaced rows.....   | 1955-56 |
| Three 15-inch spaced rows on a bed, 60 inches between bed centers.....   | 1955-56 |
| Four 10-inch spaced rows on a bed, 60 inches between bed centers.....  | 1955-56 |
| Four rows paired on a bed, two outside rows 30 inches apart, two inside rows 14 inches apart; 60 inches between bed centers..... | 1955-56 |

Studies evaluated the alkalamine salt of 4,6-dinitro-*o*-sec-butylphenol (DNBP) applied broadcast in 24 gallons of water at the rate of 9 pounds per acre of active ingredient. Applications were made within 2 days after planting.

<sup>5</sup>When the herbicides and insecticides mentioned in this publication are used in practice, proper precautions should be observed to protect humans, farm animals, and wildlife as noted on the label.

### RESULTS

Because of the heavy vine growth in the uniformly spaced 28-inch rows, the exact locations of the rows were hard to find. This caused digger congestion and resulting peanut losses. Planting 3 or 4 close rows in a bed and allowing 30 to 36 inches between the beds for equipment and tractor wheels was an effective close-row arrangement. Equipment used to plant and harvest peanuts in this manner required only minor changes, and the beds could be readily located at time of digging.

Bunch- and runner-type peanuts when flat planted, given a pre-emergence treatment of herbicide DNBP, and lightly cultivated, outyielded those planted in deep furrows, not treated with herbicide, and with heavy dirtng cultivation to control weeds. In 1954, yield increases under the two different production methods were as follows:

- (1) With the bunch-type peanuts and conventional spacing—23-percent increase; with close-row spacing—6-percent increase.
- (2) With runner-type peanuts and conventional spacing—18-percent increase; with close-row spacing—17-percent increase.

DNBP was effective for early weed control in peanut production. If cultivation was delayed for 30 days or more, more hoeing



labor was required for weed control than was required in untreated plots that received normal cultivation. Where treated areas were cultivated about 3 weeks after herbicide application, less hoeing labor was required for weed control than was required in the untreated plots.

Three or four rows were planted on a bed by mounting one or two extra planters between two conventionally spaced planters. This row arrange-

ment permitted seeding and cultivating by conventional equipment. No change was necessary in tractor wheel treads when alternating between peanuts planted in close rows and other crops planted in conventionally spaced rows.

An improved two-row peanut digger was developed. By adding longer digger blades, the same equipment could be used to dig either two uniformly spaced rows or three or four closely spaced rows.

## EXPERIMENTS, 1957-59

### MATERIALS AND METHODS

The variations in spacing experiments before 1957 led to the design and execution of a uniform 3-year experiment that involved not only planting in closer rows but also a variation in seed spacings within the rows. Two varieties of peanuts and two different harvesting methods were used in these later experiments, which were conducted in 1957, 1958, and 1959.

Peanuts were planted after a winter cover of rye that was turned with a moldboard plow. After turning, the soil was disked two to four times and spike harrowed to level the seedbed before planting. The soil was limed to a pH of 5.8 to 6.0. Gypsum was applied as a supplemental source of calcium about a month after planting at the rate of 600 pounds per acre. Aldrin at 2 pounds active material per acre was used for southern corn rootworm control, and sulfur in three applications of 25 pounds each was used for *Cercospora* sp. leaf spot control with 5-percent DDT added for leafhopper control. The two varieties of peanuts used

were Virginia Bunch 46-2 (bunch type) and Virginia 56R (runner type).

Peanut planters were calibrated for seed spacings in the drill of 6, 9, and 12 inches. Stand counts were made in 1958 and 1959 shortly after emergence. Two plants emerging within 3 or 4 inches of one another were counted as one unit. Because the preliminary studies showed that maximum yields came from peanuts flat planted and treated with DNBP, this procedure was adopted for all the later spacing studies.

Four replications of peanuts were planted in a split-plot design. The main plots had four beds, and each bed was 6 feet wide  $\times$  100 feet long. The two center beds were harvested, one by the combine method and the other by the stack pole method. Spacing for both varieties each of the 3 years was as follows:

#### Test No.

- |        |   |
|--------|---|
| 2-36-6 | Two uniformly spaced 36-inch rows with 6-inch seed spacing in rows                                    |
| 3-18-6 | Three rows, 18 inches apart, on a bed with 72 inches between bed centers; 6-inch seed spacing in rows |

- 3-18-9 Three rows, 18 inches apart, on a bed with 72 inches between bed centers; 9-inch seed spacing in rows
- 4-12-6 Four rows, 12 inches apart, on a bed with 72 inches between bed centers; 6-inch seed spacing in rows
- 4-12-12 Four rows, 12 inches apart, on a bed with 72 inches between bed centers; 12-inch seed spacing in rows

Tests 2-36-6, 3-18-9, and 4-12-12 required the same quantity of seeds for planting. A 12-inch-diameter roller trailed the planter to level the bed surface (figs. 1 and 2). A 4-wheel tractor with the same front and rear wheel treads was used for planting, cultivating, and digging. This wheel arrangement permitted the tractor to straddle the bed. The number and types of cultivations by years were as follows:

| Row spacings     | Sweeps |      |
|------------------|--------|------|
|                  | 1957   | 1958 |
| 36-inch rows (2) | 5      | 5    |
| 18-inch rows (3) | 4      | 5    |
| 12-inch rows (4) | 4      | 5    |

|                  | Weeder Sweeps |   |
|------------------|---------------|---|
|                  | 1959          |   |
| 36-inch rows (2) | 1             | 5 |
| 18-inch rows (3) | 1             | 4 |
| 12-inch rows (4) | 1             | 4 |



FIGURE 1.—Equipment for flat planting three 18-inch-spaced peanut rows on a bed with 72 inches between bed centers.

Cultivation within the bed was necessary to control weeds and to minimize hoeing labor. Small sweeps were operated between the 12- and 18-inch-spaced rows until the plant growth covered the ground (fig. 3). Later cultivations were made in the 36-inch space between the beds. Weeds that were not destroyed by cultivation or by herbicides were hoed out by hand.



FIGURE 2.—Equipment for flat planting four 12-inch-spaced peanut rows on a bed with 72 inches between bed centers.

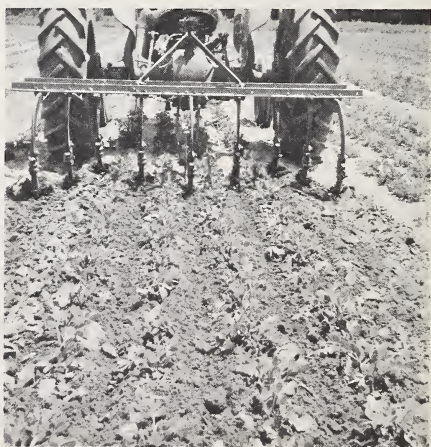


FIGURE 3.—Cultivation of four 12-inch-spaced peanut rows.



Peanuts in the experimental plots were dug with a conventional two-row combination digger-shaker-windrower equipped with longer than usual digger blades (figs. 4 and 5). Windrows were shaken about 2 days after digging and combined 6 to 8 days after digging. Peanuts from individual plots were bagged when combined and were artificially cured and dried until they reached a moisture content of 8 to 10 percent before they were weighed and graded. The conventional harvesting method consisted of stacking and using a stationary picker.

## RESULTS

### Hoeing Labor

Man-hours per acre required for hoeing peanuts planted with different spacings and treated with herbicides were recorded in 1958 and 1959 and are shown in table 1. With the bunch-type peanuts, 2-year average results showed that approximately 6 to 8 hours of hoeing labor was required for peanuts planted with either conventional or close-

row spacings, and that differences were not statistically significant. With the runner-type peanuts, 2-year average results showed that peanuts planted with conventional row spacings required approximately half as much hoeing labor as did peanuts planted with close-row spacings—5.6 and 11.3, respectively. Hoeing labor requirements were not statistically significant in 1958 but were significant in 1959.

### Yield

*Bunch type.*—Yield in pounds per acre from the bunch-type peanuts planted in close rows and analysis of the data are shown in table 2. In 1957 and 1958, higher yields were obtained from peanuts planted with close spacings than from those planted with conventional spacings; and the differences were significant at the 0.01 probability level each year. In 1959, higher yields were obtained from peanuts planted with conventional spacings, but the differences were not significant. The 3-

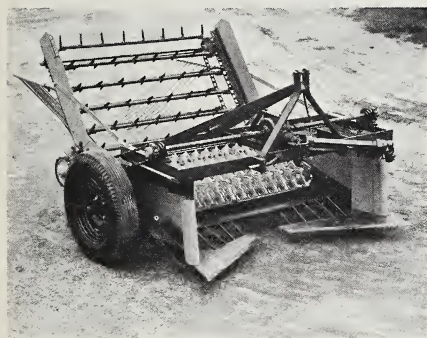


FIGURE 4.—Improved peanut digger with soil separator, conveyor, and windrowing attachment. Digger has short blades for harvesting 2 conventionally spaced rows.



FIGURE 5.—Same digger as shown in figure 4, but with longer digger blades attached for harvesting 3 or 4 closely spaced peanut rows.

TABLE 1.—*Hoeing labor requirements in man-hours per acre for peanuts planted with close-row spacings at Holland, Va.*

| Row spacings        | Bunch type |      |         | Runner type |                   |         |
|---------------------|------------|------|---------|-------------|-------------------|---------|
|                     | 1958       | 1959 | Average | 1958        | 1959 <sup>1</sup> | Average |
| 2-36-6 (check)..... | 8.0        | 5.4  | 6.7     | 4.9         | 6.4 a             | 5.6     |
| 3-18-6.....         | 5.9        | 6.8  | 6.3     | 11.0        | 8.2 ab            | 9.6     |
| 3-18-9.....         | 6.5        | 6.9  | 6.7     | 12.2        | 8.9 abc           | 10.5    |
| 4-12-6.....         | 6.5        | 7.8  | 7.1     | 14.8        | 11.9 bc           | 13.3    |
| 4-12-12.....        | 6.5        | 11.0 | 8.7     | 12.4        | 11.4 c            | 11.9    |
| Average.....        | 6.6        | 7.5  | .....   | 11.0        | 9.3               | .....   |

<sup>1</sup>Means followed by "a" are significantly different from those not having "a"; those followed by "b" are significantly different from those not having "b", etc., at the 0.05-percent level.

year average of peanuts harvested by the two methods showed that peanuts planted with close spacings outyielded peanuts planted with conventional spacings by about 4.5 percent. Peanuts planted with conventional spacings yielded an average of 3,065 pounds per acre. Those planted with close spacings yielded an average of 3,211 pounds per acre.

Yields were about equal from each of the close-row-planted peanuts. Three rows of peanuts planted with 18-inch spacings and with 9-inch drill spacings gave about the same yield as 3 rows planted with 18-inch spacings and with 6-inch drill spacings. Four rows of peanuts planted with 12-inch spacings and 6-inch drill spacings outyielded 4 rows of peanuts planted with 12-inch spacings and 12-inch drill spacings by 1.5 percent. The 3 rows of peanuts planted with 18-inch spacings gave about the same yield as did the 4 rows with 12-inch spacings.

For the 3-year summary, there was no significant difference between yields of peanuts

planted with different row spacings. Three-year average results showed that peanuts combined from the windrow yielded slightly more than those harvested by the stack method, and these yields were highly significant. Peanuts harvested by the combine yielded 3,241 pounds per acre, whereas those harvested by stacking and picking with a stationary picker yielded 3,122 pounds per acre.

*Runner type.*—Yield in pounds per acre from runner-type peanuts planted with close-row spacings and data analysis are shown in table 3. In 1957, yields from peanuts planted in close rows were higher than yields from those planted conventionally. Yields were about the same in 1958 but were lower in 1959. The 3-year average of peanuts harvested by the two methods showed that peanuts planted with close spacings yielded less than those planted with conventional spacings. Peanuts planted with conventional spacings averaged 2,946 pounds per acre, and those planted with closer spacings yielded an average of 2,918

TABLE 2.—Yield per acre of Virginia Bunch 46-2 peanuts planted with close-row spacings and harvested by stacking and combining, Holland, Va., 1957-59

| Row spacings        | 1957    |          | 1958    |          | 1959    |          | 3-year average |          | Overall average | Increase over check |
|---------------------|---------|----------|---------|----------|---------|----------|----------------|----------|-----------------|---------------------|
|                     | Stacked | Combined | Stacked | Combined | Stacked | Combined | Stacked        | Combined |                 |                     |
|                     | Pounds  | Pounds   | Pounds  | Pounds   | Pounds  | Pounds   | Pounds         | Pounds   | Pounds          | Percent             |
| 2-36-6 (check)..... | 3,144   | 3,021    | 3,112   | 3,394    | 2,842   | 2,881    | 3,032          | 3,098    | 3,065           | .....               |
| 3-18-6.....         | 3,407   | 3,121    | 3,715   | 3,820    | 2,493   | 2,708    | 3,205          | 3,216    | 3,210           | + 4.7               |
| 3-18-9.....         | 3,375   | 3,352    | 3,511   | 3,797    | 2,450   | 2,697    | 3,112          | 3,282    | 3,197           | + 4.3               |
| 4-12-6.....         | 3,688   | 3,584    | 3,357   | 3,688    | 2,411   | 2,731    | 3,152          | 3,334    | 3,243           | + 5.8               |
| 4-12-12.....        | 3,312   | 3,339    | 3,516   | 3,684    | 2,502   | 2,813    | 3,110          | 3,278    | 3,194           | + 4.2               |
| Average.....        | 3,385   | 3,283    | 3,442   | 3,676    | 2,539   | 2,766    | 3,122          | 3,241    | 3,181           | .....               |

# *Analysis of Variance*

| Year                     | Spacing treatment         | Harvesting method         | Harvesting method × treatment | Discrimination value — 0.05 level conventional versus experimental treatments |
|--------------------------|---------------------------|---------------------------|-------------------------------|---|
| 1957.....                | Significant at 0.01 level | Significant at 0.05 level | Nonsignificant.....           | 125   |
| 1958.....                | Significant at 0.01 level | Significant at 0.01 level | .....do.....                  | 128   |
| 1959.....                | Nonsignificant.....       | Nonsignificant.....       | .....do.....                  | .....   |
| 3-year summary analysis. | .....do.....              | Significant at 0.01 level | .....do.....                  | .....   |

TABLE 3.—Yield per acre of Virginia 56R runner-type peanuts planted with close-row spacings and harvested by stacking and combining, Holland, Va., 1957-59

| Row spacings        | 1957            |                 | 1958            |                 | 1959            |                 | 3-year average  |                 | Overall average | Increase over check |
|---------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------|
|                     | 1957            |                 | 1958            |                 | 1959            |                 | 3-year average  |                 |                 |                     |
|                     | Stacked         | Combined        | Stacked         | Combined        | Stacked         | Combined        | Stacked         | Combined        |                 |                     |
| 2-36-6 (check)..... | Pounds<br>2,858 | Pounds<br>2,840 | Pounds<br>3,280 | Pounds<br>3,180 | Pounds<br>2,726 | Pounds<br>2,797 | Pounds<br>2,954 | Pounds<br>2,939 | Pounds<br>2,946 | Percent<br>.....    |
| 3-18-6.....         | 3,012           | 3,139           | 3,321           | 3,312           | 2,270           | 2,558           | 2,867           | 3,003           | 2,935           | - 0.3               |
| 3-18-9.....         | 2,926           | 3,094           | 3,252           | 3,139           | 2,307           | 2,708           | 2,828           | 2,980           | 2,904           | - 1.4               |
| 4-12-6.....         | 3,312           | 2,935           | 3,194           | 3,230           | 2,109           | 2,438           | 2,871           | 2,867           | 2,869           | - 2.6               |
| 4-12-12.....        | 3,053           | 3,316           | 3,221           | 3,157           | 2,305           | 2,747           | 2,859           | 3,073           | 2,966           | + 0.6               |
| Average.....        | 3,032           | 3,064           | 3,253           | 3,203           | 2,343           | 2,649           | 2,875           | 2,972           | 2,923           | .....               |

### Analysis of Variance

| Year                     | Row spacings        | Harvesting method         | Harvesting method × spacing |
|--------------------------|---------------------|---------------------------|-----------------------------|
| 1957.....                | Nonsignificant..... | Nonsignificant.....       | Nonsignificant.             |
| 1958.....                | do.....             | do.....                   | Do.                         |
| 1959.....                | do.....             | Significant at 0.01 level | Do.                         |
| 3-year summary analysis. | do.....             | Significant at 0.01 level | Do.                         |



pounds per acre. Four 12-inch-spaced rows of peanuts with 12-inch drill spacings were the only close-row-spaced peanuts that yielded slightly more than those conventionally planted. Yields from peanuts planted with different close-row spacings were about the same. For example, yields from peanuts planted in three 18-inch rows with 9-inch drill spacings were about equal to yields from peanuts planted in three 18-inch rows with 6-inch drill spacings. Yields from peanuts planted in four 12-inch rows, with 12-inch drill spacings, were about 100 pounds per acre more than yields from peanuts planted in four 12-inch rows with 6-inch drill spacings. Yields from peanuts planted in three 18-inch rows were about equal to those from peanuts planted in the 12-inch rows—the difference was only 2 pounds per acre.

The 3-year average results showed that peanuts harvested by combining yielded slightly more than those harvested by stacking—2,972 and 2,875 pounds per acre, respectively, or a difference of 97 pounds per acre. The 3-year summary analysis showed no significant difference in yield of peanuts caused by different row spacings. However, the analysis showed that the harvesting method was significant for runner peanuts, with the higher yields coming from peanuts harvested by combining.

### *Grades*

*Bunch type.*—Grades of bunch-type peanuts grown in the close-row spacing tests are shown in table 4.

Grades of peanuts planted with conventional spacings and

harvested by both methods were compared with grades of peanuts planted with close spacings. The 3-year averages were as follows:

Fancy pods, 78.8 and 78.5 percent, respectively  
Extra large kernels, 40.9 and 38.2 percent, respectively  
Sound, mature kernels, 64.9 and 64.4 percent, respectively

The 3-year summary analysis revealed no significant difference in grade between fancy pods and sound, mature kernels caused by the differences in space plantings. However, for the extra large kernels, there was a significant difference due to the difference in space plantings. The highest yield of extra large kernels came from peanuts planted with conventional spacings.

*Runner type.*—Grades of runner-type peanuts grown in the close-row spacing tests are shown in table 5.

Grades of peanuts planted with conventional spacings and harvested by both methods were compared with grades of peanuts planted with close spacings. The 3-year averages were as follows:

Fancy pods, 73.0 and 74.2 percent, respectively  
Extra large kernels, 32.8 and 34.3 percent, respectively  
Sound, mature kernels, 64.8 and 66.3 percent, respectively

The 3-year summary analysis of grade revealed that there was no significant difference in grade between peanuts graded as fancy pods, extra large kernels, and sound, mature kernels caused by differences in space plantings.

TABLE 4. — *Peanut grades of Virginia Bunch 46-2 variety, grown and harvested by two methods at Holland, Va., 1957-59*

FANCY PODS

| Row spacings        | 1957    |          | 1958    |          | 1959    |          | Average |          | Average of both harvesting methods |
|---------------------|---------|----------|---------|----------|---------|----------|---------|----------|------------------------------------|
|                     | Stacked | Combined | Stacked | Combined | Stacked | Combined | Stacked | Combined |                                    |
|                     |         |          |         |          |         |          |         |          |                                    |
| 2-36-6 (check)..... | Percent | Percent  | Percent | Percent  | Percent | Percent  | Percent | Percent  | Percent                            |
| 3-18-6.....         | 78.0    | 70.0     | 88.2    | 80.5     | 77.5    | 79.0     | 81.2    | 76.5     | 78.8                               |
| 3-18-9.....         | 76.7    | 68.2     | 91.7    | 84.2     | 71.2    | 75.7     | 79.8    | 76.0     | 77.9                               |
| 3-18-9.....         | 79.0    | 70.5     | 90.5    | 81.5     | 76.7    | 85.0     | 82.0    | 79.0     | 80.5                               |
| 4-12-6.....         | 75.2    | 63.2     | 91.0    | 84.5     | 70.7    | 77.5     | 78.9    | 75.0     | 76.9                               |
| 4-12-12.....        | 71.5    | 71.7     | 90.0    | 85.7     | 77.0    | 76.7     | 79.5    | 78.0     | 78.7                               |
| Average.....        | 76.0    | 68.7     | 90.2    | 83.2     | 74.6    | 78.7     | 80.2    | 77.0     | 78.6                               |

EXTRA LARGE KERNELS

|                     |      |      |      |      |      |      |      |      |      |
|---------------------|------|------|------|------|------|------|------|------|------|
| 2-36-6 (check)..... | 46.7 | 40.5 | 44.5 | 45.7 | 32.2 | 36.0 | 41.1 | 40.7 | 40.9 |
| 3-18-6.....         | 42.0 | 36.2 | 46.0 | 41.2 | 30.7 | 26.0 | 39.5 | 34.4 | 36.9 |
| 3-18-9.....         | 44.7 | 37.7 | 44.5 | 40.0 | 32.2 | 31.2 | 40.4 | 36.3 | 38.3 |
| 4-12-6.....         | 42.2 | 37.7 | 46.0 | 42.2 | 30.5 | 29.0 | 39.5 | 36.3 | 37.9 |
| 4-12-12.....        | 44.0 | 41.2 | 45.0 | 41.0 | 34.5 | 34.0 | 41.1 | 38.7 | 39.9 |
| Average.....        | 43.9 | 38.6 | 45.2 | 42.0 | 32.0 | 31.2 | 40.3 | 37.2 | 38.7 |

SOUND, MATURE KERNELS

|                     |      |      |      |      |      |      |      |      |      |
|---------------------|------|------|------|------|------|------|------|------|------|
| 2-36-6 (check)..... | 64.7 | 63.2 | 63.5 | 66.5 | 65.0 | 66.7 | 64.4 | 65.4 | 64.9 |
| 3-18-6.....         | 64.0 | 60.2 | 65.7 | 65.2 | 65.2 | 64.7 | 64.9 | 63.3 | 64.1 |
| 3-18-9.....         | 64.7 | 62.0 | 61.7 | 63.7 | 67.2 | 66.5 | 64.5 | 64.0 | 64.2 |
| 4-12-6.....         | 65.5 | 63.5 | 64.2 | 65.2 | 64.0 | 64.7 | 64.5 | 64.4 | 64.5 |
| 4-12-12.....        | 66.5 | 63.7 | 64.2 | 64.7 | 65.7 | 65.2 | 65.4 | 64.5 | 64.9 |
| Average.....        | 65.0 | 62.5 | 63.8 | 65.0 | 65.4 | 65.5 | 64.7 | 64.3 | 64.5 |

TABLE 5.—*Peanut grades of Virginia 56R runner variety, grown and harvested by two methods at Holland, Va., 1957-59*

FANCY PODS

| Row spacings        | 1957    |          | 1958    |          | 1959    |          | Average |          | Average of both harvesting methods |
|---------------------|---------|----------|---------|----------|---------|----------|---------|----------|------------------------------------|
|                     | Stacked | Combined | Stacked | Combined | Stacked | Combined | Stacked | Combined |                                    |
|                     |         |          |         |          |         |          |         |          |                                    |
|                     | Percent | Percent  | Percent | Percent  | Percent | Percent  | Percent | Percent  | Percent                            |
| 2-36-6 (check)..... | 66.5    | 64.5     | 76.0    | 74.5     | 77.7    | 78.5     | 73.4    | 72.7     | 73.0                               |
| 3-18-6.....         | 69.0    | 65.7     | 79.5    | 76.7     | 77.5    | 73.7     | 75.3    | 72.0     | 73.6                               |
| 3-18-9.....         | 71.7    | 69.2     | 81.5    | 76.5     | 77.5    | 74.0     | 76.9    | 73.2     | 75.0                               |
| 4-12-6.....         | 70.0    | 74.7     | 82.0    | 84.7     | 74.5    | 73.0     | 75.5    | 74.1     | 74.8                               |
| 4-12-12.....        | 70.5    | 64.7     | 81.0    | 78.7     | 72.0    | 74.7     | 74.5    | 72.7     | 73.6                               |
| Average.....        | 69.5    | 65.7     | 80.0    | 78.2     | 75.8    | 74.7     | 75.1    | 72.9     | 74.0                               |

EXTRA LARGE KERNELS

|                     |      |      |      |      |      |      |      |      |      |
|---------------------|------|------|------|------|------|------|------|------|------|
|                     |      |      |      |      |      |      |      |      |      |
| 2-36-6 (check)..... | 37.2 | 33.2 | 31.5 | 28.0 | 33.0 | 34.2 | 33.9 | 31.8 | 32.8 |
| 3-18-6.....         | 40.0 | 35.0 | 37.7 | 33.0 | 32.2 | 32.2 | 36.6 | 33.4 | 35.0 |
| 3-18-9.....         | 40.2 | 37.0 | 35.2 | 32.2 | 32.5 | 31.2 | 35.9 | 33.4 | 34.6 |
| 4-12-6.....         | 41.5 | 35.0 | 34.5 | 35.0 | 29.2 | 30.7 | 35.0 | 33.5 | 34.2 |
| 4-12-12.....        | 40.5 | 33.5 | 34.2 | 32.5 | 31.0 | 30.5 | 35.2 | 32.1 | 33.6 |
| Average.....        | 39.8 | 34.7 | 34.6 | 32.1 | 31.5 | 31.7 | 35.3 | 32.8 | 34.0 |

SOUND, MATURE KERNELS

|                     |      |      |      |      |      |      |      |      |      |
|---------------------|------|------|------|------|------|------|------|------|------|
|                     |      |      |      |      |      |      |      |      |      |
| 2-36-6 (check)..... | 67.5 | 66.2 | 64.0 | 62.5 | 65.5 | 63.7 | 65.6 | 64.1 | 64.8 |
| 3-18-6.....         | 70.5 | 68.0 | 65.5 | 64.5 | 64.0 | 68.0 | 66.6 | 66.8 | 66.7 |
| 3-18-9.....         | 70.0 | 70.0 | 64.5 | 62.2 | 66.7 | 66.2 | 67.0 | 66.1 | 66.5 |
| 4-12-6.....         | 70.0 | 69.0 | 65.0 | 66.0 | 64.2 | 62.5 | 66.4 | 65.8 | 66.1 |
| 4-12-12.....        | 69.5 | 67.0 | 64.0 | 65.2 | 63.5 | 67.7 | 65.6 | 66.6 | 66.1 |
| Average.....        | 69.5 | 68.0 | 64.6 | 64.0 | 64.7 | 65.6 | 66.2 | 65.8 | 66.0 |



## DISCUSSION

### *Stands*

*Virginia Bunch 46-2 variety.*— Emergence of Virginia Bunch 46-2 variety of peanuts was determined in 1958 and in 1959. In 1958, peanuts planted with 6-inch spacings emerged an average of 8.7 inches apart; those planted with 9-inch spacings, 11.4 inches apart; and those planted with 12-inch spacings, 15.3 inches apart. In 1959, peanuts planted with 6-inch spacings emerged an average of 7.8 inches apart; those planted with 9-inch spacings, 11.1 inches apart; and those planted with 12-inch spacings, 13.9 inches apart.

*Virginia 56R runner variety.*— Emergence of Virginia 56R runner variety of peanuts was determined in 1958 and in 1959. In 1958, peanuts planted with 6-inch spacings emerged an average of 9.2 inches apart; those planted with 9-inch spacings, 13.8 inches apart; and those planted with 12-inch spacings, 15 inches apart. In 1959, peanuts planted with 6-inch spacings emerged an average of 6.3 inches apart; those planted with 9-inch spacings, 9 inches apart; and those planted with 12-inch spacings, 11.8 inches apart.

### *Planting and Cultivating*

Three or four closely spaced rows of peanuts may be planted and cultivated at about the same speed and convenience as two conventionally spaced rows. In 1959, peanuts of both varieties planted with conventional row spacings were cultivated one more time than were those planted in close rows. On this occasion, immediately

after the conventional row spacings had been cultivated, rain prevented cultivation of the closely spaced rows. The runner-type peanuts required more hoeing labor than did the bunch type, although each was planted and cultivated alike and on the same days in the same field. The area planted in runners may have had more weeds. Use of a herbicide, plus frequent close cultivations, gave relatively good weed control. For maximum yields and minimum cultivation and hoeing labor, use of an effective herbicide is considered essential, particularly with close-row plantings.

### *Yields*

The 3-year average yield from the bunch-type peanuts planted in close rows showed an increase of only 146 pounds per acre over peanuts planted with conventional spacing. This slight increase may have been caused by the low rainfall in 1959. Rainfall in August and September 1959 was 7.28 inches less than normal for those months, and yields of peanuts planted with conventional spacings surpassed yields of peanuts planted in close rows that year. This was a reversal from yield figures for 1957 and 1958.

Yields from peanuts planted with conventional spacings in 1957 and 1958 were 345 pounds per acre less than yields from those planted in the 3-row combination and 354 pounds per acre less than yields from peanuts planted in the 4-row combination. Average yields from all peanuts planted with close-row spacings were greater than those from peanuts planted with conventional spacings by 349



pounds per acre. Thus, the 2-year average results showed a yield increase of about 11 percent for peanuts planted in close rows, but only a 4- to 5-percent increase for the 3-year average.

The 3-year average yield from the runner-type peanuts planted in close rows was less than that from peanuts planted with conventional spacings, with one exception. Peanuts planted with conventional spacings had higher yields in 1959, probably because of the dry season. The 2-year average yield for 1957-58 showed that peanuts planted in the 3-row combination outyielded those planted with conventional spacings by 110 pounds per acre; and those planted in the 4-row combination outyielded those planted with conventional spacings by 138 pounds per acre. Average yields from all peanuts planted with close-row spacings were greater than those from peanuts planted with conventional spacings by 124 pounds per acre.

The results of these tests indicate that peanuts planted with close-row spacings will, under normal weather conditions, outyield peanuts planted with conventional spacings. In a dry year, however, results indicate that higher yields may come from peanuts planted with conventional spacings. Eastern Virginia does not often have droughts; and, generally, peanuts planted with close-row spacings would probably yield more than peanuts planted with conventional spacings.

The same quantity of seed per acre was required for planting two of the close-row spacings (3 rows, 18 inches apart, with 9-inch spacings and 4 rows, 12 inches apart, with 12-inch spacings) as was required for planting peanuts with conventional

spacings. The data indicate that bunch-type peanuts planted in 3 rows, 18 inches apart, with 9-inch drill spacings, would give the highest net yield of any close-row combination tested.

This spacing would not require additional seed, and only one additional planter would be needed. Three rows could be more conveniently planted and cultivated than four rows and would probably require less hoeing labor.

### *Harvesting*

A bed of peanuts planted in closely spaced rows may be dug as easily as peanuts planted in two conventionally spaced rows. However, peanuts in the close rows do not windrow as easily or uniformly and with as many of the vines inverted, as do peanuts planted in conventionally spaced rows. If the crop is to be stacked, additional labor is required to separate tangled vines; and some peanut losses will result. Yields were slightly higher from combining than from stacking. Combines are believed to be more efficient than are stationary pickers.

### **SUMMARY**

Experiments conducted in 1957-59 with peanuts flat planted with conventional and close-row spacings and treated with a herbicide showed that, with bunch-type peanuts, hoeing labor requirements for weed control were about equal regardless of row spacing. The runner type planted in closely spaced rows required more hoeing labor than those planted in conventionally spaced rows.

In 2 of the 3 years (1957 and 1958), both bunch- and runner-

type peanuts planted in close rows outyielded those planted in conventional rows by 349 and 124 pounds per acre, respectively. The 3-year average yield of the bunch-type planted in close rows showed an increase of 146 pounds per acre over those planted with conventional spacings, whereas the runner-type planted in close rows showed no increase in yields. The 3-year results were not significant due to any of the spacing treatments with either type. However, the bunch type responded significantly in favor of close-row planting in 2 of the 3 years.

The bunch-type peanuts planted in conventionally spaced rows produced more extra large kernel peanuts than did those planted in close rows.

Closely spaced peanut rows were effectively planted and cultivated with conventional farm equipment. A peanut digger equipped with a power-operated conveyor and soil separators was developed for digging, shaking, and windrowing conventionally spaced peanut rows. By mounting longer digger blades, the same equipment was used for digging either three or four closely spaced peanut rows.